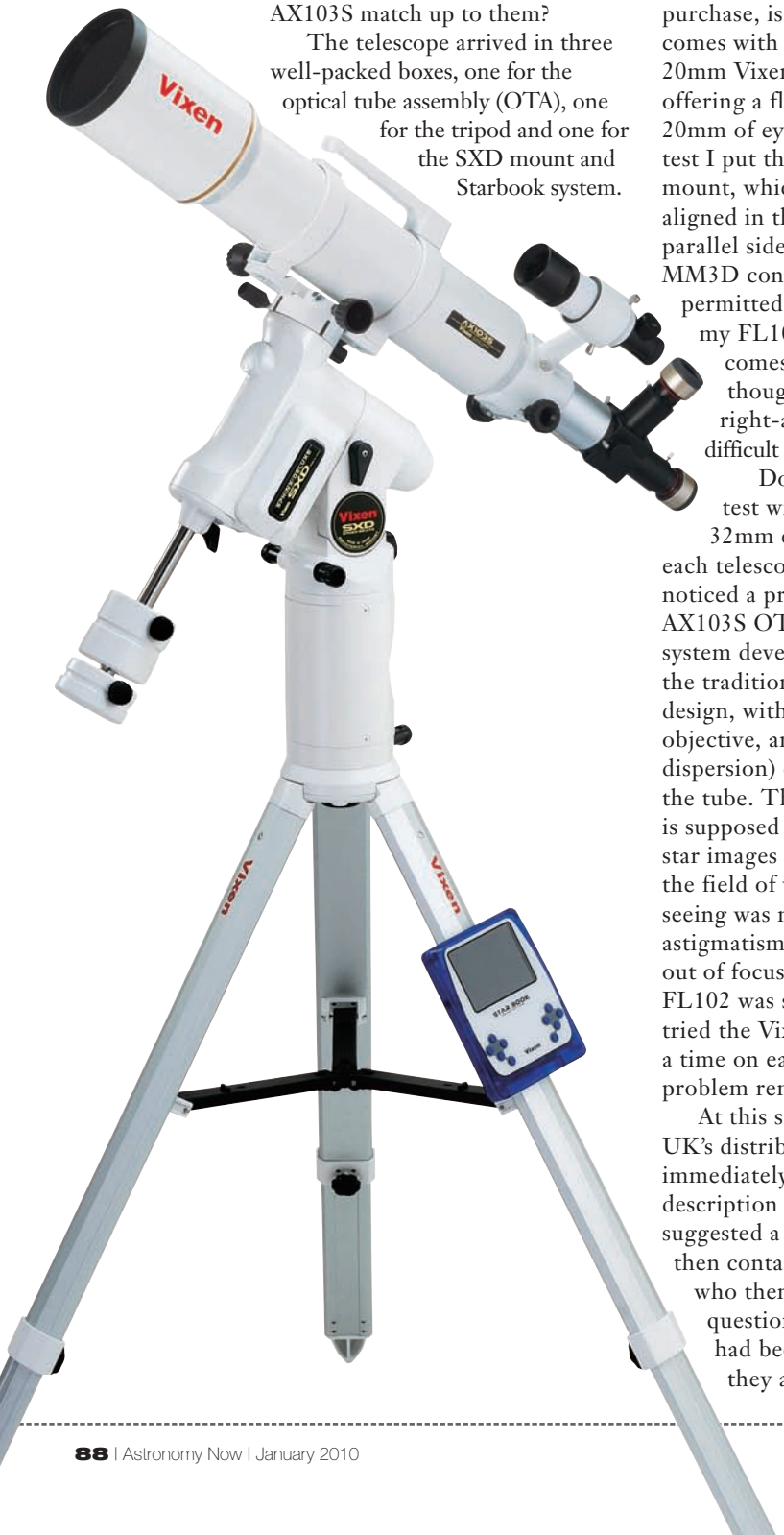
The Vixen **AX103S**

Nick Howes reviews the new quad-element Vixen AX103S telescope and SXD Mount, and finds out if its accompanying Starbook should be judged by its cover.



I **own** two Vixen telescopes, a beautiful FL102 and an A80M that I use for my modified PST. Optically they are both brilliant. Could Vixen's new quad-element AX103S match up to them?

The telescope arrived in three well-packed boxes, one for the optical tube assembly (OTA), one for the tripod and one for the SXD mount and Starbook system.

The quality of the OTA finish is first rate. It comes with a dual speed focuser that, whilst possibly not in the same league as some of the standalone ones you can purchase, is still good. The OTA comes with excellent 5mm and 20mm Vixen NLV eyepieces, offering a flip-up eyecup that gives 20mm of eye relief. As an initial test I put the OTA on my EQ6 mount, which was set-up and polar aligned in the observatory, with a parallel side-by-side Ambermile MM3D configuration that permitted me to run it alongside my FL102. The AX103S comes with a finderscope, though sadly this is not a right-angled type, making it difficult to use with many objects.

Doing an initial star test with a pair of matching 32mm eyepieces, one on each telescope, I immediately noticed a problem with the AX103S OTA. The quad-element system developed by Vixen takes the traditional triplet optical design, with its three-element objective, and adds an ED (extra dispersion) element further down the tube. This field corrector lens is supposed to provide tack sharp star images right to the edge of the field of view, but what I was seeing was notable coma and astigmatism when moving in and out of focus. By comparison my FL102 was significantly better. I tried the Vixen eyepieces one at a time on each telescope, but the problem remained.

At this stage I contacted Vixen UK's distributor, Opticron. They immediately asked for a detailed description of the problem, suggested a few things to try, and then contacted Vixen Japan, who then sent back some more questions, but by this time it had become apparent that they also had a unit that seemed to have a similar issue.

Some companies would try to fob you off with excuses but not Vixen. The pride of the Japanese engineers and Opticron who wished to make it right had a courier picking up my OTA and a new one delivered within a few days, shipped in directly from Japan. Would this happen to a regular customer, I wondered, or was it just because of the review process? A few discrete phone calls to other Vixen customers left me convinced that this was not a one-off, and that if an end-user has any issue at all with a new Vixen product, the same level of support and effort to put it right would occur.

Working well

The new OTA arrived, and instantly it was a different ballgame. This one really did deliver almost perfect star points 98 percent of the way to the edge of the telescope. Aiming it at a few of my favourite autumnal objects, such as M33, M31 and a dipping M27, the views were excellent. Fine and coarse focus was good, and once in focus with the lock on, objects held focus perfectly. At f/8 the telescope is also a good performer on planets, with views of a small Mars and a low down Jupiter delivering nice results. The OTA has a retractable dew shield, which makes it good to move around, and given its quite hefty weight (nine kilograms) this is a blessing.

However, my next issue came with the flip mirror supplied. Vixen have provided an optical system that delivers stunning views to the edge, and then supply a flimsy 1.25-inch flip mirror system. I own the Trutek flip mirror, which is built like a tank and can take the weight of any camera placed on it. The Vixen version not only reduces the ability to use two-inch eyepieces (though you can use the un-screwable rear M42 thread for

▲ Vixen's AX103S sports a dual speed focuser that helps in getting fine focus on any object. Image: Nick Howes.

◀ A narrowband image of NGC 281 taken through the AX103S with an Atik 314L camera shows pin-sharp stars across the whole image. The larger format cameras that could be used should show similar results because of the four-element design of the AX103's tube. Image: Nick Howes.

cameras), but also doesn't look strong enough to hold some of the heavier models that could be attached to it. It probably is, but it just looks too flimsy to risk putting something like a big SBIG or Finger Lakes camera on it. The attachment ends are also via screws and not compression rings, something I believe Vixen should address with a new flip mirror system in the near future.

The two other parts of the telescope are the mount tripod and mount head/Starbook system. Although the tripod initially looks too flimsy to be of any use, in actual fact it is very robust, although it could benefit from a locking spreader like the one found on the Sky-Watcher EQ6. Although not included as standard, Vixen can supply an accessory tray for the tripod which doubles up as a locking spreader. Adjusting it is simple and solid with easy to turn large knobs permitting a wide range of heights to be used. In reality, for any serious astrophotography work, or if you were using the OTA with another telescope side-by-side or piggyback, you'd probably fit the mount to a pier (which Vixen also make).

The mount head similarly looks miniscule in comparison to something like an EQ6, but this is the SXD, which Vixen have fundamentally re-designed from the original Sphinx series to have quite staggering load capacity for a mount of this size. Putting it into perspective, the mount looks about the same size as the Sky-Watcher HEQ5, and has similar features in terms of the positioning of the handbox and power input plugs, but can take a load of 50 pounds on its Vixen (of course!) head. The mount head has the handbox d-sub serial style input, along with power supply and the power switch.

The power supply (12V) is somewhat odd, given the nature of this product. The input cable is not your standard 'centre positive' barrel type, but a design I have rarely seen. Worst of all, it's hardwired to a large plastic battery pack, which takes eight 'D' size batteries that would be difficult for anyone to recharge (and also very costly to buy) all at once. The battery pack comes in a leather-look case (made of plastic), which is not something you want swinging from the mount, but there's no proper way to hold either the Starbook or the battery unit. However, you can purchase Vixen's mains adaptor (£119) or cigarette lighter adaptor (£17) separately.

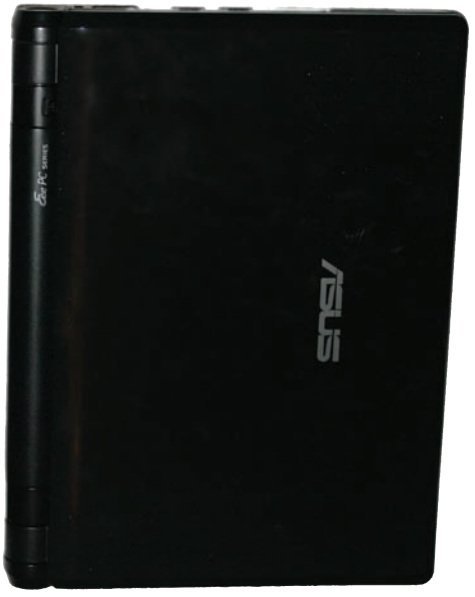
In use the mount is very good, and very quiet. Slewing at full rate is close to the very low volume levels I get from my EQ6 mount. However, notable by its absence on the mount head was the autoguider port.

Starbook

Which brings me on to the Starbook. When this was initially released in 2003/04, the idea of putting a large format display onto a handbox with effectively a full-blown planetarium application was unique and quite clever. Much has been written about the quirky nature of its operating system, but I found it a joy to use and very easy to set up. Today the Starbook is showing its age somewhat, looking like a retro handheld arcade game. However, Opticron have stated that a new generation of Starbook is expected for release later this year, but for the time being we're stuck with the old model.

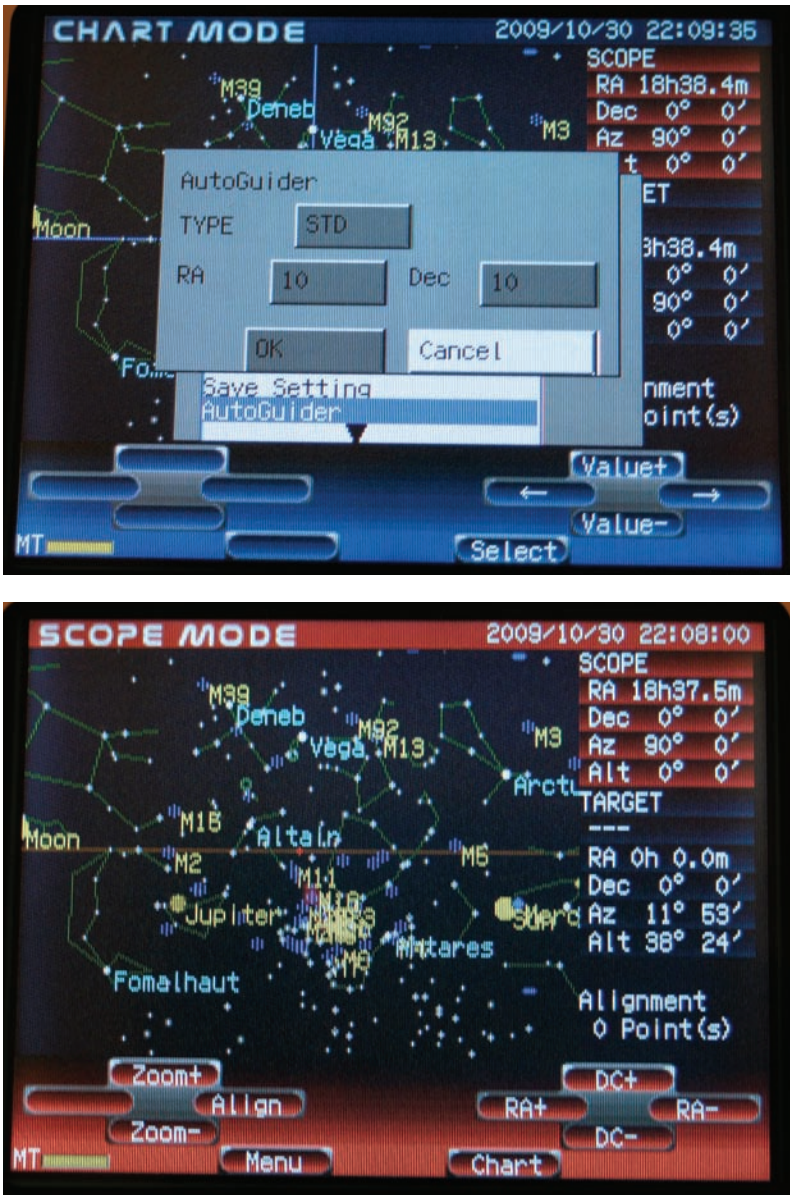
"THE VIXEN AX103 DELIVERED PERFECT STAR POINTS 98 PERCENT OF THE WAY TO THE EDGE OF THE TELESCOPE, AND OBJECTS HELD FOCUS PERFECTLY."

▼ The Starbook's size is almost the same as a modern netbook, making its overall usefulness possibly less than when it was released. Image: Nick Howes.



In practice, after setting up the telescope, the Starbook was pretty accurate, getting most of the objects I selected in the field of view of the 20mm eyepiece. It has two modes, which are easy to switch between. 'Chart' mode lets you initially pick an object, learn about it, and then you can kick-in the GOTO to slew to it. In 'scope' mode the Starbook display follows where you go with the telescope. It has a comprehensive database of more than 22,000 objects, but lacks a simple way to update comet data, for example, without resorting to a bizarre LAN connection method. Given that most laptops have one Ethernet port and some may not support the automatic crossover function, a crossover LAN cable should have been included in the box. Furthermore, the update of firmware or comet data requires you to understand IP protocols and configurations (updates from other manufacturers come with a free application and the correct cable in the box to easily update the firmware via a download). The screen is also very bright, even when dimmed, and I found myself lightly tacking some red film over it to make it more comfortable. Vixen does have some opaque LCD cover film available that will do the job, priced at £7.50 for a pack of two.

The only way to autoguide the SXD is via the handbox. This approach means that the Starbook always has to be part of the chain. I connected up PHD Guide and my TS OAG with the Meade DSI-C that I use for autoguiding, and found that it guided quite well once I had tweaked the backlash settings, and set up the guide speed via the Starbook.



▲ **Screenshots from the Starbook. Images: Nick Howes.**

Concluding remarks

I have very mixed feelings about this product. On the one hand the mount load capacity and size are ideal for serious use, but the tripod and Starbook quirks make it something that would not sit well in my home observatory set-up. The pointing accuracy is good, and the slew/motors are excellent. The mount and OTA are superbly crafted products let down by some bizarre omissions and quirks. As a field telescope for star parties I can see this being a winner. For permanent set-ups, someone needs to come up with a way to control the mount from a PC without the Starbook in the way. The polarscope could do with refinements as well, but it's well described in the owner's manual.

On the other hand the optics, once the initial issue was resolved, were first class, and if you lose the dire flip mirror and put a serious CCD or wide-field eyepiece on this product you will not be disappointed with what you see. It's a premium price point and delivers optics to match, but with so many good Chinese-made triplets on the market, and competing against mounts like the less expensive EQ6, I sadly feel that it may struggle to gain the following that Vixen's proud heritage deserves.

◀ **The Vixen AX1093 comes with two excellent eyepieces, which offer good eye relief and a twist action eyepiece cup. Image: Nick Howes.**

Nick Howes is the Senior Test Engineer at Yamaha R&D and is the Technical Liaison Officer for Wiltshire Astronomical Society.

At a glance

Price:	£2,695 (OTA) £2,510 (SXD mount and tripod)
Objective lens:	103mm triplet ED apochromat
Focal length:	825mm
Focal ratio:	f/8
Supplied with:	5mm and 20m eyepieces
Available from:	Opticron
Tel:	01582 726522
Website:	www.vixenoptics.co.uk